Met Office

NEWS

Extreme weather reveals changing climate

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A new report by the Met Office, published today, reveals further details about changes in the UK's climate since the 1960s. The report reveals changes in extreme weather as measured by temperature and rainfall extremes.

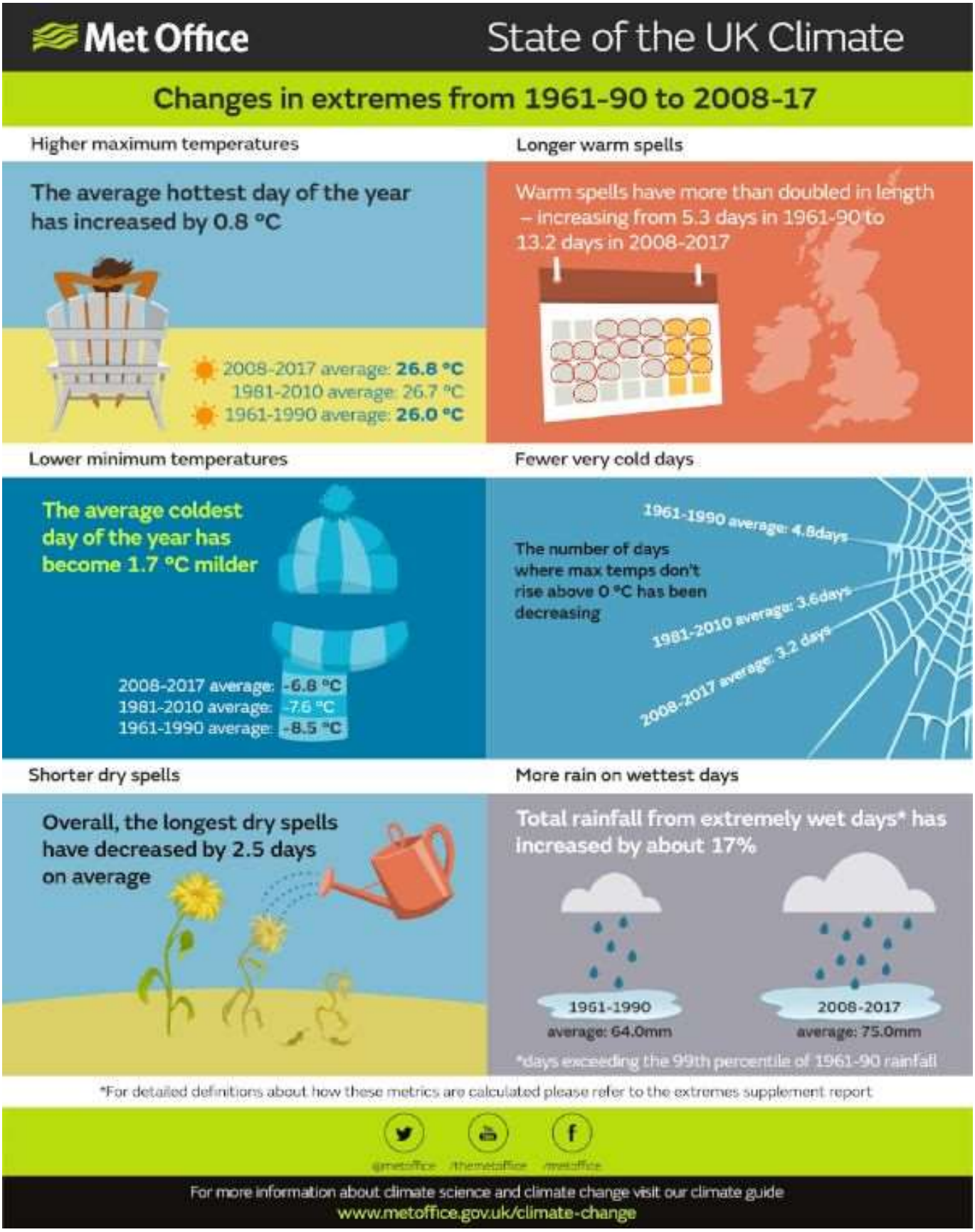
By comparing different meteorological reference periods, a number of interesting trends can be observed. For example, the hottest day of each year over the most recent decade (2008-2017) in the UK has been on average 0.8 °C warmer than the hottest day of each year over the period 1961-1990. Conversely, the lowest temperature of the year has shown an even greater increase, becoming 1.7 °C milder between the two periods in the UK.

This study uses a set of measures agreed around the globe by the World Meteorological Organization and World Climate Research Programme, and are widely used in global climate change research. These metrics include at least one measure – Tropical Nights – which is currently not a common feature of the UK climate, but it could become more widespread in future. Tropical nights are defined as 24-hour periods when the minimum temperature doesn't fall below 20.0 °C.

Dr Mark McCarthy is the head of the Met Office's National Climate Information Centre, the team which produced the report. He said: "Monthly, seasonal and annual climate data provide a valuable record of the changing climate in the UK. However, these average figures have a tendency to mask extreme weather and climate events. So in our latest report we have focussed on those measures which record weather extremes – complementing our recently published State of the UK climate 2017 report – which shows how the UK's climate is changing."

Commenting on the tropical nights measure, Dr McCarthy added: "Minimum overnight temperatures of over 20.0 °C in the UK are rare currently and even during this summer this threshold was only exceeded on a few occasions. However, with projections in climate suggesting warmer temperatures, it is useful to have this metric in place, so that future changes can be monitored."

The report summarises a set of core indices, which can be obtained from temperature and rainfall data. It also shows climate shifts for UK countries and regions, along with maps showing the data across four time periods: 1961-1990; 1981-2010; 2008-2017; and 2017.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State of the UK Climate
Changes in extremes from 1961-90 to 2008-17
Higher maximum temperatures
The average hottest day of the year has increased by 0.8 °C
2008-2017 average: 26.8 °C
1981-2010 average: 26.7 °C
1961-1990 average: 26.0 °C
Longer warm spells
Warm spells have more than doubled in length – increasing from 5.3 days in 1961-90 to 13.2 days in 2008-2017
Lower minimum temperatures
The average coldest day of the year has become 1.7 °C milder
2008-2017 average: -6.8 °C
1981-2010 average: -7.6 °C
1961-1990 average: -8.5 °C
Fewer very cold days
The number of days where max temps don't rise above 0 °C has been decreasing
1961-1990 average: 4.8days
1981-2010 average: 3.6days
2008-2017 average: 3.2 days
Shorter dry spells
Overall, the longest dry spells have decreased by 2.5 days on average
More rain on wettest days
Total rainfall from extremely wet days* has increased by about 17%
1961-1990
average: 64.0mm
2008-2017
average: 75.0mm
*days exceeding the 99th percentile of 1961-90 rainfall
*For detailed definitions about how these metrics are calculated please refer to the extremes supplement report
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Key temperature indices and UK results:

Highest maximum temperature: highest value of daily maximum temperature for each calendar year, averaged over climatological reference periods.
UK: 1961-1990 average 26.0 °C; 2008-2017 average 26.8 °C.

Summer days: annual count of days where the daily maximum temperature was above 25.0 °C
UK: 1961-1990 average 4.5 days; 2008-2017 average 5.3 days.

Tropical nights: annual count of days where the daily minimum temperature was above 20.0 °C.
Currently not common in the UK climate.

Warmspell duration index: duration of at least six days with daily maximum temperature well above climatological average for the time of year.
UK: 1961-1990 average 5.3 days; 2008-2017 average 13.2 days.
Warm spells have more than doubled in duration between 1961-1990 and 2008-2017.

Lowest minimum temperature: Lowest value of the daily minimum temperature for each calendar year, averaged over climatological reference periods.
UK: 1961-1990 average -8.5 °C; 2008-2017 average -6.8 °C.

Icing days: Annual count of days where the daily maximum temperature was below 0.0 C
UK: 1961-1990 average 4.8 days; 2008-2017 average 3.2 days.

Key rainfall indices and UK results:

Maximum 5-day precipitation: Highest value of the five-day precipitation amount (mm) for each calendar year, averaged over climatological reference periods.
UK: 1961-1990 average 77.8 mm; 2008-2017 average 81.4 mm.

Longest wet spell: Longest sequence of days with 1 mm or more of rainfall each calendar year, averaged over climatological reference periods.
UK: 1961-1990 average 12.4 days; 2008-2017 average 12.9 days.

Longest dry spell: Longest sequence of days with less than 1mm of rainfall for each calendar year, averaged over climatological reference periods.
UK: 1961-1990 average 20.5 days; 2008-2017 average 18.0 days.
Overall, the longest dry spells have decreased by 2.5 days, on average.

Rainfall from extremely wet days: Total annual precipitation from falling on the wettest days, averaged over climatological reference periods.
UK: 1961-1990 average 64.0 mm; 2008-2017 average 75.0 mm.
Total rainfall from extremely wet days has increased by about 17%.

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